THE
# VETERINARY JOURNAL

**Editor :**

FREDERICK HOBDAY, C.M.G., F.R.C.V.S., F.R.S.E.,
HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING;
MAJOR IN THE ROYAL ARMY VETERINARY CORPS.
HONORARY MEMBER OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.
CORRESPONDANT ÉTRANGER DE LA SOCIÉTÉ DE MEDECINE VÉTÉRINAIRE DU BRABANT (BELGIUM).

**Sub-Editor :**

GLADSTONE MAYALL, M.R.C.V.S.

NOVEMBER, 1919.

## Editorials.

### "SALARY" OR "PITTANCE"?

TIMES are hard for everyone just now in England; lucky indeed are those of our profession who have been able to retain their comparatively well paid and comfortable appointments in the Royal Army Veterinary Corps. It rests with ourselves to boycott all underpaid positions, for where we are needed our services are bound to be sought for and obtained. Even the junior public appointments ought to be plums of the profession for the most brilliant of our young graduates, instead of which they are usually sought after by those who have proved failures in other spheres or where absolute inexperience of private practice before obtaining the diploma makes them dread to face the judgment of a critical *clientèle.*

Recently an advertisement has appeared for the services of a fully qualified man as Superintendent of Markets in India, at a salary which is absolutely ridiculous and "second class" passage, the latter showing the standard in which the Veterinary Profession is classed.

We need not, however, go away from home when one reads that our own Board of Agriculture ask for whole-time, fully qualified Veterinary Inspectors at the princely salary of £200 a year (plus War Bonus, which may be taken off at any time), rising by annual increments of £10 (the usual rise asked by a domestic servant) to £300. £300 a year should be the minimum start; no professional man can live on less, and unless he is gaining experience for his future career no man should take less.

After being tied up by red-tape regulations to one class of work for several years, especially if in the meantime he marries and has a family to think of, it is next to impossible for a man to make a fresh start in a more lucrative branch, and his life becomes one long continual struggle of genteel poverty. The farrier, the plumber, the miner, and indeed any class of workman or tradesman is far better off than he, the professional man, who has spent at least £600 and four good years of his life earning nothing but knowledge and being an expense on an already over-burdened parent.

Our Government billets should command the best men; the proverb that "the labourer is worthy of his hire" applies just as much to our profession as any other. After what we spend on our professional training, the idea of what the future will be when one is 33 or perhaps 42 years old and has attained the giddy height of £300 a year to live and rear a family upon makes one shudder. Far better embark in commerce, where individual effort has scope, or take even the smallest of country practices, where one gets freedom of action; but to coop one's self up in a department where one only waits for dead men's shoes, unless one gets a salary to compensate, is utter folly, and the young men of our profession should make full enquiries of the older before taking the final step.

How did the Army Veterinary Corps obtain its present status and emoluments? Absolutely by boycott, and in this the profession and the council to a man were loyal to them. The time has come when our Chief Public Service, too, must be brought to understand that the best of our young men are willing to join them, but they must be paid in acc rdance with their merits, not forgetting the fact that when they enter the Service they give up their lives entirely to this alone and become totally unfitted for other branches of the professsion.

## VETERINARY EDUCATION IN INDIA.

VETERINARY work in India up to the present has been distinguished by the vastness of the field for the practice of the science and art of veterinary medicine and surgery, and the excellent efforts of a devoted but by far too sparse band of labourers to cope with the gathering in of a full, adequate, and complete harvest of animals' health, welfare and production. Every report that has come to hand, since some effort was made in 1892 to form a Civil Veterinary Department, has emphasised and accentuated the old tag in its application to Indian veterinary affairs that "the harvest truly is great but the labourers are few."

We need not enlarge on the bounteousness of the harvest field—horses, camels, cattle, elephants, sheep and goats exist in abundance. They all need care, grading up and efficient supervision as regards the maintenance of health and the eradication of disease. The amount of annual wealth in the Presidencies, Dependencies and States needs safeguarding in the best and most complete manner possible. True scientific advancement will be satisfied with no half measures and no retrogressive steps. The whole field of veterinary operations must be wisely surveyed, and organisation, administration and technical detail and skill be brought up to a full and worthy progressing standard. The veterinary body in India has not been ignorant of the incompleteness of its work and efforts, but it has always been very hard for it to get its views thoroughly and sympathetically reviewed and supported by the Government. Money has not been scarce, but trade and commerce have always seemed to get a better share for the asking than science. It is so with the great majority of world governments; science, instead of being regarded as the valued hand-maiden of trade and industry, is looked on as an interloper, a faddist, a dreamer, an amiable gentleman with no business instinct, or a starving dog that ought to be satisfied with a few compensatory crumbs from the moneyed autocrats' treasury table. Such a view is all wrong. Science, instead of following with downcast eye and its tail between its legs, ought to be put in the forefront, leading with its head erect, directing and controlling with flashing eye and no uncertain voice. It ought to be put in this position by those who hold the authority and control the purse strings.

The cry in India is for a better class of education for the veterinary graduate. To attract a better class of man the rate of pay must be considerably increased. The labourers will be few until they receive the due reward for the best head and hand work. We in the old country should stand by our brethren in India and lift up our voices in favour of their claims and demands. The land is the richest of our possessions. It can afford to have a veterinary service second to none in efficiency and pay, and all of us concerned must be as importunate and unceasing as possible in a demand for a full and complete recognition by the Government of India of claims to secure the fullest improvement, advancement and production of its animal life and its health and wealth.

Recently (March, 1919), there has been a first meeting of veterinary officers in India, when 27 members and visitors attended. Such subjects as " the Necessity for Reorganisation of the I.C.V.D.," " Research," " Veterinary Education," " Veterinary Dispensaries (stationary and itinerary,)"—" Surra, Rinderpest, Tuberculosis," and " Fostering of the Animal Industry in India " were discussed.

Two or three very important resolutions were moved and carried at this meeting, and perhaps their recital here will be interesting and instructive to us in the homeland. They will give us some idea of what India wants and is crying for. Colonel Walker proposed and Mr. Oliver seconded, and it was carried :—

" That this meeting is of opinion that the present constitution and organisation of the Civil Veterinary Department are utterly inadequate to cope with the work demanded of it, and it therefore respectfully represents to the Government of India the absolute necessity of filling up all existing vacancies in the I.C.V.D. without delay, and would emphasise the importance of a large expansion of all provincial departments to deal with the ordinary veterinary work of the country."

Colonel Walker proposed and Colonel Farmer seconded the following resolution :—" That the department should be placed in a position to deal with the diseases of animals, veterinary instruction, and all operations for improving the breeds of horses and agricultural stock in India."

A committee was formed to report on the whole subject of veterinary education. The Committee met and suggested revision of the curricula, raising of the educational standard for entrance to the colleges, approximation of the college course to the lines adopted in Great Britain and Ireland.

It will be seen that our brethren in India are proceeding on strong constitutional lines, and we wish all power to their elbows and that the efforts they are making for the good of the Empire of India and for the advancement and welfare of our profession will be crowned with success. G. M.

## A DECLINE IN CATTLE PRACTICE.

From our own experiences, from a study of recent veterinary literature, from correspondence with veterinary surgeons in various parts of the kingdom, and from a knowledge of the food position and the measures taken to deal with it, we have come to the conclusion that there has been a serious decline in cattle practice in this country during the last two or three years. Cattle that used to be treated for illness are now being slaughtered for human food on the first signs or indisposition. We do not read of any cases of rumenotomy, recorded cases of milk fever have been very few, indigestion and hoven in cattle, as far as we are concerned, seem almost to be things of the past, and even cases of mammitis finish very frequently and sometimes very early in the hands of the butcher. Cattle owners believe that it pays them better now to slaughter soon than to have their cows doctored for illness; in fact, in many cases they have merely called in the veterinary surgeon as a matter of convenience to smooth the passage of an ailing animal into the hands of a layman meat inspector.

In the last statistical year milch cattle have increased considerably in number, but there is no evidence that there has been any corresponding revival in cattle practice. It will not be to our credit if this branch of our work slips away from us, and something ought to be done to enable us to regain our proper position in respect to cattle, and to keep more in touch with them. One of the most crying needs of the times is a renewal in full force of the Tuberculosis Order. Any attempt to deal with the scourge that overlooks the proper control and inspection of milch cattle is merely an utter farce with a very serious side. At a time in our history when there was never more reason for a rigid application of the Tuberculosis Order nothing at all seems to be being done in the matter.

A strong and earnest cry ought to go out for some adequate inspection of meat which should be under the efficient control of duly qualified veterinary surgeons and not largely in the hands of any aspirer to the office, who has sufficient local influence and cheek to take it up, as is the case at present. Inspection of cow-sheds as to hygiene and examination of cows as to their state of health ought to be under the supervision and control of veterinary surgeons if any real good is ever to be done in the matter of a pure milk supply. At a time when concern about the general health of the public has never been so loudly and persistently proclaimed by publicists, politicians and tub-thumpers perhaps there has never been a period when so little real sound, solid scientific reasoning has been brought to bear on the carrying out of measures to secure and ensure the thorough prevention of disease and the maintenance of the highest standard of health of the human and animal world.

The " Quo Vadis " address of our esteemed ex-President, the after-dinner speeches of the distinguished men at the Trocadero Restaurant, both point the warning and indicating finger to those really anxious and desirous to improve the health of the nation. The men of science must lead before real progress is attained, but they must also keep on shouting, proclaiming, proselytising and button-holing before they will stand even a ghost of a chance of leading in this materialistic and selfish age.

In time, perhaps, as flocks and herds increase, some part of the past paying cattle doctoring will return to the fold of the general practitioner, but there is more than a modicum of truth in the hint of Sir Daniel Hall, K.C.B., that the future of our body lies more in the prevention of animal disease than in its cure. Let us try and make sure that we take and hold our proper place, and oust all usurpers in the domain of the prevention of animal disease.

G. M.

# Original Communications.

## PARTIAL PARALYSIS OF THE SINGLE COLON.

By W. T. HOWETSON, M.R.C.V.S.
*Brampton.*

THE case that I am going to record is not very familiar to me, as I have only met with three cases showing exactly the same symptoms, and all three died, though they gave me ample time to cure them, each case living from three weeks to a month. All the cases were met with during the months of July and August while grazing on old pasture land that was somewhat bare of grass.

The first case was a Clydesdale gelding four years old off; the second a Clydesdale mare five years old off, about two months gone in foal; the third case was a Clydesdale mare three years old off.

The symptoms manifest in all the cases were as follows:—Each horse was very much tucked up in the flanks, being similar in this respect to a greyhound; the breathing was normal as regards the number of respirations per minute, but each animal made a slight obstructive noise from the nostrils; in the nose was a slight obstruction caused by an accumulation of a reddish coloured material adherent to the lower part of the schneiderian membrane, but there was not any discharge from the nose.

The temperature at the commencement registered 105°F., but the following day it registered 102° and remained at 101° and 102° during the whole course of the illness. The pulse was normal as regards the number of beats per minute, but it was weak and soft. The mucus membranes were not injected but dirty looking.

A symptom that was peculiar and present in each case was profuse perspiration over the anus and vulva, in addition to the adjoining skin that was covered by the tail; there was also a flickering or tremor of the muscles of the shoulders and hips, and this became less marked after the bowels were opened, though more or less still present throughout the disease. Each horse manifested partial paralysis of the muscles of deglutition; the bolus when passing down the œsophagus seemed at times to give the horse pain, as he occasionally made a peculiar sound when swallowing, arched his neck or turned his head sharply sideways. The appetite was not totally lost in any of the cases; the patient would eat a little food daily, particularly if it were something new. There was not any abnormal thirst, but the animal would drink two or three quarts of water or thin gruel two or three times daily. The fæces at the commencement were not exactly dry, but passed in small quantities and coated with mucus. During the course of treatment this excretion varied in colour from pale to the colour of a Dunlop motor tyre, and it had a peculiar smell. The urine was at the first

highly coloured, otherwise from the appearance the naked eye could not detect anything amiss, as it was passed regularly and in the usual quantities. On entering the box the patient would come forward and meet you ; if offered something to eat he would eat a few mouthfuls, then turn away, go to the far end of the box, turn round and place his hips against the wall and stand always in the same place, with his four feet brought near together under the body ; the neck was held somewhat rigid and dropped, the nose being slightly drawn in to the breast, giving the animal the appearance of being camel or ewe-necked. When standing in this position the eyelids would slightly droop, and you then could hear the obstruction in the breathing, and an occasional clamping of the jaws or grinding of the teeth. When moving about the horse did not show any marked weakness or any staggering in his movements. He was much stronger in his movements than he appeared.

After examining my first case, I came to the conclusion, rightly or wrongly, that the animal had received a chill sometime previous, which had affected the bowels and caused partial paralysis of these organs ; the ingesta was therefore retained longer than it should, and as a consequence of undergoing putrefactive changes a poison was thus generated, and, this being absorbed, caused the animal to eat less daily.

The horse became tucked up in the flanks, and fever set in with tremor of the muscles. With this idea as being the cause I commenced to try and clear the bowels of the impurities, and to restore the appetite to normal, but did not anticipate any difficulty likely to occur in doing so ; however, after treating the case for a week, commencing with a laxative, viz., aloes and calomel, followed by tonics, antiseptics and stimulants such as nux vomica, ammon. carb. and gentian, in ball form, and hyposulphite of soda was given in the drinking water. The patient was not any better, though it did not appear to an ordinary observer to be seriously ill, yet there was not any improvement in the pulse, which was the most important and disappointing feature in all the symptoms. As the case did not appear better or worse I suggested to the owner that it would be desirable to have a second opinion ; at this he expressed surprise, and asked me if I thought the horse would die. I did not then expect him dying, but I considered it would be best to have another opinion now, as there might be a better chance to bring about recovery. The owner then expressed a wish for Mr. J. Henson, of Carlisle, to see the case. We met in consultation and agreed in the diagnosis. As the horse was difficult to ball or drench, Mr. Henson advised that strychnine and nuclein solution might be tried and given hypodermically. I might here say that all the cases were difficult to ball or drench—they did not swallow well, and there

was danger of choking the patient unless great care was taken in administering the drench, so in all the cases the medicine was given in ball form, in the food, drinking water, or hypodermically. The animal died a fortnight after Mr. Henson saw it. When the second case came under my observation I wrote to Mr. Henry Thompson, Aspatria, giving him a brief description of the symptoms manifested. As both cases occurred on farms where mugwort grows freely I thought possibly the horses might have eaten of this plant owing to the scarcity of herbage. Mr. Thompson did not consider this the cause, and informed me that horses rarely, if ever, ate mugwort; he thought by the description given it might possibly be a case of pernicious anæmia, but there was not any anasarca or any signs of dropsy in any of the cavities. Mr. Thompson would have seen the case, but at the time he was unwell, nevertheless he kindly suggested medicinal remedies for me to try. My third case occurred on a farm where mugwort is absent. All the drugs given proved of no avail, as in all the three cases death ensued. The following were the drugs given:—Aloes and calomel to open the bowels, also small doses of linseed oil during the course of the disease, as the bowels tended to be costive and sluggish. After opening the bowels, tonics, stimulants, and antiseptics were given to improve the appetite, such as gentian, nux vomica (pulv.) strychnine, and nuclein solution, hypodermically, ferri sulph. sodæ: bicarb., sodium chloride. Sodæ hyposulphite, acid nitro hydrochlor, dil., and liq. arsenicalis.

The diet given was of as laxative a nature as possible, and consisted of bran, oatmeal, gruel, milk, hay, tea, oil cake, meal, carrots, an occasional turnip and fresh mown grass; of those the patient would take a little for a day or two and would then refuse to eat unless he had a change of diet; the patient ate and drank something daily, but not sufficient to hold his own; throughout the course of the disease the patient generally stood, but laid down occasionally; at no time were there any signs of abdominal or colicky pains. Before the end came the horse collapsed, was unable to rise, nor could he be lifted, as he seemed to have no energy left to help himself; in each case the animal lay for about twelve hours and died.

Post-mortem lesions.—I was able to make a post-mortem examination on the two last cases. From the naked eye all the organs appeared healthy with the exception of the single colon. The pellets of dung in this bowel were here and there embedded in the mucous membrane and covered with mucus, and when removed left a congested surface beneath.

In one of the cases there was mechanical pneumonia, brought about by administered milk or gruel gaining access to the lungs; in this case towards the last the owner would persist in drenching the patient

with milk, as he took so little food. In both cases there was an ante-mortem clot in the heart.

To say the least, all cases were disappointing to me. I tried my best to bring about a cure and failed; similar cases may be familiar to many practitioners, and some may have been successful in adopting a different method of treatment; if so, I for one would be grateful to hear of it; or were all these three cases too far advanced before treatment was commenced?

---

## HYPODERMIC MEDICATION IN EQUINE COLIC.

By J. F. D. TUTT, M.R.C.V.S., F.R.M.S., F.Z.S.
*Winchester.*

ALTHOUGH of recent years the use of various hypodermic products has been pretty general in the treatment of Equine Colic, the recorded results and opinions of Veterinarians have been very sparse indeed. This fact has been mentioned elsewhere, and an invitation was extended to members of the profession to express their views, an exchange of which would without doubt enable some definite conclusions to be drawn.

The opinions given in text-books are not always consistent with facts, and it is only by opinions based on actual observations made on a large number of cases that conclusions of any real practical value can be drawn.

A drug that has given success with one practitioner may have given the very opposite with another, and it is with the hope that others may give their views that the following observations based on a very large number of cases, in all classes of animals, are placed on record. Further, the views expressed are to be regarded as opinions drawn from the observations made.

The following agents have been used:—

### PILOCARPINE.

The two salts used have been the nitrate and the hydrochloride. Some seem to prefer the former, but there appears to be no real difference as regards action or utility between the two. The latter appears to be more rapidly soluble in boiled water, but possibly this may be due to the consistency of the tabloid, as it has been found that tabloids prepared by various druggists differ greatly as regards their being readily soluble in boiled water.

It appears that this preparation can be given with perfect safety, even in the pony, in doses as large as two grains, although one grain or even half a grain in the smaller breeds will in many cases suffice. Speaking in a general way, it would appear that in most cases the dose should not be less than a grain.

In cases where the heart is weak, the alleged ill effects on the heart, owing to the drug stimulating the cardiac terminations of the vagus, can be overcome in large measure by preceding its use, or even combining with it, strychnine sulphate up to a grain.

Unlike physostigmine or Arecoline, there would appear to be little or no danger of rupture of the intestine following its use in cases where there is tympany.

In fact, it seems to be a perfectly safe remedy.

No cases of abortion following its use have been observed in the pregnant mare, although Milks, in his work on Veterinary Pharmacology and Therapeutics, states that it may do so.

It has been used with marked beneficial results in flatulent colic and in impaction with or without tympany.

The drug can be used alone, or combined with strychnine as noted above or with physostigmine. In cases of impaction where no tympany has been present, good results have been obtained by giving it in doses of 1 to 2 grains, with one grain of physostigmine.

*Its action* is usually rapid. The first symptom noted, and which can be regarded as indicative that it is having effect, is *salivation*. This may be very profuse, depending on the amount given. In cases where a dose of 2 grains has been given, salivation is usually very pronounced. This symptom may be observed as soon as ten minutes after injection, but on the average the period has been from 20 to 30 minutes, and it may be even longer. It has been noted that in cases where the drug has not been what druggists term " physiologically tested," that this symptom may not occur, but it should do so if it is to be of any use.

In very favourable cases this is followed by fæcal evacuation. This may be quite small in amount to start with, increasing later. In one particular case no less than seven fæcal evacuations were noted within an hour of its administration.

*The dose* recommended is 1 to 2 grains. More than this should not be given to start with, but the total may be raised to four grains when a previous dose has not given appreciable results.

The time that has been allowed to elapse has generally been from four to five hours.

It has been noted, however, that, providing there is no tympany, better results will follow the use of physostigmine rather than by repeating the pilocarpine.

Physostigmine appears to be a greater stimulant to peristalsis than pilocarpine, and it appears feasible to suppose that the impacted mass, being already more or less softened by the secretion of the in-

testinal juices (stimulated by the pilocarpine): is, rendered more easy to expel with increased peristaltic action.

No ill effects have been noted when the dose of pilocarpine has been repeated under the time above stated. A period is naturally given, so as to give the initial dose every chance of completely acting before repeating it unnecessarily.

In cases where the pulse has been weak, the custom has been to give strychnine to start with, and in the course of an hour or two, if the pulse is better, to give pilocarpine.

PHYSOSTIGMINE.

The salts in general use are the salicylate, sulphate, and the benzoate. The benzoate has been chiefly used.

There seems little doubt that this is a valuable and probably more commonly used agent in impaction than the preceding.

From my own observations it would appear to be *strongly contra-indicated* in cases where there is tympany, owing to the fact that there is grave danger of rupture of the bowel.

This is no doubt due to the violent peristalsis induced on a bowel already distended to almost bursting point.

*Example.*—In a case of impaction accompanied by tympany, the horse had been ill some hours, and two injections of pilocarpine had been given. Physostigmine was then given alone, and a fatal termination took place in six hours, after intense colic. *Post-mortem* revealed an extensive rupture of the double colon at the pelvic flexure. There appears little doubt that physostigmine was the cause of death, and a practically analogous result was noted in another case where arecoline was used.

Contrary to the opinion given in Milks in the work already quoted, physostigmine does *not* appear to strengthen the heart. In fact it would appear to be strongly contra-indicated where the heart is weak, and even more so than pilocarpine, although pilocarpine is known by physiological experiments to slow the heart.

*Example.*—A fatal termination was noted in two cases within ten minutes of its injection, where there was a weak pulse. Death in both cases was undoubtedly due to cardiac action.

However, as Milks observes, the effect of physostigmine on the heart has not been well worked out.

Combined with pilocarpine, its utility is augmented.

The dose of physostigmine recommended is one grain, but two grains can be given in bad cases in the heavier breeds.

ARECOLINE.

This drug appears to be very popular with many veterinarians, and just as unpopular with others. It was probably the most commonly

used hypodermic remedy in the Army, so an exchange of views will no doubt give such information. Generally speaking, the remarks made with regard to physostigmine can be applied to arecoline. It is equal and by many considered a more powerful cathartic than the preceding, and my observations support this view. Some allege that its drawback is the fact that aloes cannot be given either before or after its use without producing ill effects.

This, however, does not seem warranted from experience in the Army. Here the first aid practised by the R.A.V.C. sergeant in cases of colic, was to administer an aloes ball, and more often than not a chloral ball as well. The latter was undoubtedly a perfect curse to the Service, as it was small, and was very rarely swallowed without being chewed by the patient, with resulting excoriation, and the " cure " was worse than the complaint.

That the ill effects of using it with or after aloes was not observed may be due to the fact that the strength of the " Standard " ball was four drams.

Very good results have been obtained in impaction with this drug, but, like physostigmine, it appears to be contra-indicated where there is tympany, and certainly my observations tend to support this view.

The salt used is the hydrobromide, and the doses range from half a grain to 2 grains.

Two grains can be given with comparative safety in the heavy draught. This dose has in fact been given several times to a riding horse with no visible ill effects.

Frohner gives the toxic dose for the horse at 3 to 4 grains, and the fatal dose at $7\frac{1}{2}$ grains, Milks states that he had one horse recover from ten grains, and the writer has given six grains within a space of 24 hours to an artillery horse with impaction, and obtained recovery. The initial dose was two grains. No result affording any relief being obtained, I gave four grains after a lapse of 12-15 hours. Very intense colic followed by copious evacuation of the bowels followed, and a good recovery was made.

### Strychnine Sulphate.

In cases of exhaustion and weak pulse, or where there is dyspnœa, the value of this drug cannot be over-estimated. Its use has already received notice when discussing pilocarpine.

In cases where pilocarpine and physostigmine have not produced all that has been desired, the hypodermic injection of a grain of this preparation has had marked benefit in many cases.

A *recent case is cited* for example of its use :—

An aged cart gelding had had intermittent colic all day, accompanied by profuse sweating. The owner to " dry " the horse had tied

it on the highest ground on his farm to a rick, exposed to a piercing cold wind!

When seen at 8 p.m. the animal was in intense pain, laboured respirations, pulse almost imperceptible, temperature 103.

Strychnine sulphate one grain was given hypodermically. A perceptible strengthening in the pulse was noticed as early as ten minutes after injection. The breathing was practically normal in two hours and the temperature had fallen to 101.6 in the morning at 9 a.m. Fæcal evacuation took place at 12 midnight, and continued afterwards at varying intervals, and the patient made a good recovery. A drastic cathartic such as physostigmine, judging from previous observations, would have been fatal.

MORPHIA.

I have had very little success with this drug in cases accompanied by intense abdominal pain, except in a few cases where a large dose (8 to 10 grains) has been given, and then its effect has often been of a transient nature.

On the other hand chlorodyne in ʒss doses every four hours has given better results.

In one case of intermittent colic accompanied by intense pain, in a riding horse, ten grains were administered, and the patient remained drowsy for twelve hours, and was quite all right afterwards.

Milks states that small doses are sedative to the horse, but this has not been my experience, and I doubt if others agree with his statement.

APOMORPHINE HYDROCHLORIDE.

I have seen no record of the employment of this drug, save as an emetic for dogs and cats. According to Milks it has been used as a specific for licking disease of cattle, and wool pulling or eating of sheep.

This drug has given favourable results in doses of a tenth of a grain in cases of gastric tympany in the horse. The dose can be repeated at intervals of 30 minutes to an hour if required.

The question would now naturally arise "Should hypodermic cathartics be alone relied on in colic?"

Personally, I would give a negative reply. After all, the effect of a hypodermic cathartic is transient, *i.e.* it is not so prolonged as aloes, for example.

My custom has been to give an aloetic ball in addition to remedy given hypodermically, as it "completes" the cure. The hypodermic agent paves the way, so to speak, for the aloes, and seems to lessen the time before it acts.

Strychnine sulphate administered hypodermically, for example, in a case where an aloetic ball has been given (with other remedies

such as pilocarpine or physostigmine) will " hurry up " the action of the ball.

It hardly seems necessary to add, in conclusion, that particular attention must be paid to the pulse before using any hypodermic remedy, and the condition of colic presented. Further, always examine per rectum.

Hypodermic remedies must be selected with just the same care as remedies administered per os.

---

## CASTRATION OF THE BOVINE MALE.

By T. INGLIS M.R.C.V.S., J.P.
*Forfar.*

I observe an excellent article on the above subject has recently been read by Mr. G. Howie, M.R.C.V.S., Alford, at a meeting of the North of Scotland Division of the National Veterinary Medical Association.

The writer deserves great credit for his throughtly practical paper on a subject which is always interesting to the country practitioner.

I quite agree with Mr. Howie when he mentions that very little has been written in veterinary books of the castration of the bovine. The newly qualified find a great difficulty and a good deal of anxiety when they start practice in a district where calf-rearing is general, if they have not seen country practice previous to being qualified.

Much depends on the success of the operation both in horses and calves, and any new starter being unfortunate enough to have a few deaths amongst his castrations, it is a very long time before the public get confidence in their new veterinary adviser. The older practitioner, having won the confidence of his clients, may at any time have as many deaths after operations as his younger neighbour, but the public think someone else has blundered, and he, being established, gets nearly clear of all blame. A country practitioner should always be an adept in the operation of castration, either in the horse or calf. He should always be up-to-date in his methods, and follow antiseptic principles as near as it is possible with these animals.

To make a wound at all in the scrotum of the young bull always courts disaster, more or less; apart from the operator's hands, the animal's hindquarters are always contaminated, and it is likely to lie amongst filth with the wounded scrotum in a favourable position to receive all that is possible in the way of septic infection.

No matter how careful the operator may be, his patient cannot be kept in a condition favourable to antiseptic principles..

It is quite astonishing how few of these animals go wrong after the operation, but that is no reason why every care should not be exercised with regard to cleanliness.

Some young bulls develop stiffness, which continues for a considerable time, solely due to wound infection ; others again seem to heal right away.

I never favour the casting of young bulls or calves for castration, and never do it.

Should the animal be well grown and strong, I keep his head tied up to assist in holding him.

My method is to have a man to hold the head (by the lower jaw for preference), for the reason explained by Mr. Howie in his paper.

I always like to get the animal up against something on his right side, with a man forcing gently against the left. I have the animal's tail held by this man in his left hand, and his right gripping the point of the hock firmly, and pulling the hocks slightly apart.

This assistant, if he has had experience, can do a good deal with his knee to prevent the animal from lying down. Now as to the method of operation : it is very interesting to observe the various methods, but why, at this time of day, ought we to make an incision in the scrotal sac at all, when the means of a successful operation without it is within our reach ?

My partner and myself operate on a very large number yearly, and never resort to the old method. We use the Italian instrument. It has its advantages and few disadvantages.

The advantages are—no matter what the operator has been doing with his hands—he can operate right away, which means a good deal to the busy practitioner.

Another advantage is this, that it can be used at any season and in any climate, and the animal afterwards can be housed in any kind of place.

The disadvantages are these :—

Great care has to be exercised in its use ; the operator has to make sure that the cord has been crushed, as it is like to slip to one side when the pressure is applied ; and, secondly, the testicles remain the same size for a time, giving the animal an appearance of not having been castrated.

If such young bulls are exposed for sale too soon afterwards it may lead to trouble, even though the exposer can give a guarantee that the animals will not leave stock.

In using Burdizzo's Castrator the animal, in my opinion, must not be cast, but operated on in the standing position.

The operator hands the instrument to an assistant, with instructions as to its use ; then, standing on the left side, he grasps the right testicle in his right hand pulling on it fairly tight, and with his left he forces the cord to the outside of scrotum with the thumb on the pos-

terior, and the fingers on the anterior wall of sac ; this, if firmly done, keeps the cord steady and tight.

The instrument is then applied, and the part steadily crushed through ; this ought to be done twice, and about half an inch between each bruise, to make sure that the instrument has done what is required of it.

The other testicle is done in the same way, only the position has to be reversed.

No dressing if any kind need be applied, but if anyone wishes to make an application, it ought to be in the form of a powder—any other dressing would have a tendency to make the skin slip within the jaws of the instrument. An ointment could be applied afterwards, but we never treat the bruised tissue in any way, and have never had any suspicion of sepsis.

In 1913, whilst attending a Post-Graduate Course in London, Mr. John Brown, F.R.C.V.S., Invergordon, mentioned to some of the class that he possessed a Burdizzo's Castrator, and having obtained permission to demonstrate its use upon several young bulls at the College, he had it sent South, with the result that everyone who witnessed it being used by Mr. Brown was much taken with it. Since 1913 we have used no other instrument in calf castration, and, if carefully used, there is no better method.

The instrument is now used by many practitioners, who, I am sure, find it as I have described. The cattle owners, too, take to the method, and I am not aware of a single case where its use has been in a layman's hands.

I noticed in the discussion at the Veterinary Society Meeting many of the members appeared to be somewhat sceptical about the use of the Burdizzo Castrator, and I ventured to give my experience of it in general practice.

---

## THE SURGICAL NARCOSIS OF HORSES BY CHLORAL HYDRATE GIVEN INTRAVENOUSLY.

BY ALFRED SAVAGE, B.S.A., D.V.M.
*MacDonald College Quebec, Canada.*

THE use of chloral hydrate in such doses as to produce surgical anæsthesia is not new. It has been described by many writers of whom, unfortunately, neither agree as to its safety, nor upon the method by which it should be administered.

Giving it intravenously is condemned by Cadiot (1) and Rehse (2). Hobday (3) says : " It can be used intravenously, but except for dissection subjects or demonstration purposes this method is inadvisable on account of its dangers."

On the other hand, Muir (4), having given 60 grams to a horse, writes that "it is perfectly safe to give that amount in one hour's time intravenously, in two doses."

Nocard (5) considered that the drug thus used yielded to no other anæsthetic.

Bernardini (6), after a long and painstaking study, concludes that " the narcosis by intravenous injection of chloral hydrate following the method indicated is absolutely without danger and inconvenience ; it gives the best and most uniform results."

From the writer's experience, which embraces nearly 200 cases (only one of which died under the anæsthetic) the following are outstanding recommendations for the intravenous use of chloral hydrate.

1. Dietary preparation of the patient is unnecessary.
2. The drug is easily given.
3. There is no period of excitement as in chloroform anæsthesia.
4. The effects are immediate and therefore progressively controllable (sedative : narcotic : general anæsthetic) according to the amount given.
5. The after effects of proportionate doses of pure, thoroughly diluted chloral hydrate given to ordinary patients are practically nil.

Among the objections which have been raised against this manner of using the drug are that—

1. If even a small quantity finds its way into the subcutaneous tissue, a local abscess or a varying degree of phlebitis will result.

2. There is danger of allowing an air bubble to enter the jugular with immediate and dire consequences.

3. It is unsafe.

To the first two of these objections the writer replies that using a 2 per cent. to 3 per cent. solution he has inadvertently allowed a few drachms of the fluid to escape into the peri-venous structures on several occasions, and has deliberately injected 5-10 c.c., of air into the jugular without in either case producing any outward effect.

Apart from technique, dosage and the observance of what appear to be advisable precautions, the question of safety seems to resolve itself into the chemical condition of the material used. The drug is an aldehyde, and therefore comparatively unstable. It is decomposed by sunlight, alkalies and ammonia with the formation of *hydrochloric acid, free chlorine, formates* and possible *phosgene* according to the agent by which it is acted upon. Care is necessary, therefore, to ascertain that only fresh pure chlorate hydrate is used. It should be kept well stoppered and stored in the dark.

The routine followed by the writer depends upon drugs calculated to obviate the undesirably depressing effects of chloral on the cardiac ganglia, heart muscle and the respiratory centre. Atropine, camphor and occasionally strychnine are used for this purpose.

Atropine sulphate, grains ¼ to ½ is, given hypodermically half an hour or so before the operation. This acts as a respiratory stimulant, and by paralysing the N. Vagus terminations in the heart muscle releases that organ from a certain amount of restraint. The larger quantity (1½ grains) not necessarily producing a more rapid pulse than the smaller, and sometimes causing the animal to bloat in from 6 to 10 hours afterwards, is only given to very heavy horses.

While waiting for the atropine to act (which may be judged by the dilation of the pupil) the operator shaves a 3 in. by 4 in. area near the base of the patient's jugular furrow—usually the offside for choice—cleans whatever instruments he may use and prepares his chloral solution according to this formula. For each 100 lbs. of horse allow 1½ drams of chloral hydrate. Dissolve the total amount in sufficient clean warm tap water to make a 2 to 3 per cent. solution. Filter through absorbent cotton placed in a small funnel.

The quantity of water used serves a two-fold purpose—reducing the irritant effect of the drug and providing such volume that the animal can scarcely suffer shock because of its sudden administration. To substitute normal saline solution for good drinking water would doubtless be a more scientific procedure; in actual practice, however, it has thus far proved unnecessary.

As soon as ready and before the temperature falls below blood heat, the solution is injected into the jugular vein of the standing animal. The simplest apparatus for this purpose consists of a suitable cannula, a yard or so of rubber tubing and an ordinary 2-quart enamelled irrigator, which is elevated by hand during the injection. An attachment elsewhere described by the writer (7) whereby a syringe is converted into a pump is more satisfactory.

Very shortly after the solution begins to flow into his circulation the animal becomes dull. Soon he pays no attention to noises and will not wink if a hand is opened suddenly before his eyes. This stage of narcosis is ample for firing spavins or tendons and the castration of nervous stallions in the standing position. Combined with local anæsthesia by infiltration it is quite enough for more extensive and painful procedures.

If the injection is continued the animal begins to sway behind, may stagger a bit, and eventually falls down rather heavily, often pulling the rubber connections apart as he does so. Most animals when they have gone down lie fairly quietly, their eyes rolling

rhythmically to and fro (nystagmus) with the corneal reflex persisting. Should any particular animal thrash around after falling, he is given enough chloral solution in the recumbent position to carry him to the desired stage of narcosis. This reached, it is advisable to apply hobbles, unless that has already been done, because in about 15 minutes the narcosis begins to gradually pass off.

If the full narcotic effect has been attained the patient will breathe regularly though slowly; the pulse is soft and full, and most sensibility to pain absent. The mucous membranes are somewhat redder and darker than normal. Sweating is a bad sign.

When profound narcosis has been obtained, the danger point is not far away in many cases. At this stage, as a matter of precaution, the writer administers hypodermically one ounce of olive oil containing 20 per cent. camphor, spreading the dose over three places to avoid causing a local abscess. The camphor is intended solely as a cardiac stimulant, Marfori (8) having shown that a mammalian heart poisoned by chloral hydrate to such an extent that it had almost ceased to beat, will revive under the action of this substance. Animals whose ability to tolerate a narcotic dose of chloral is doubted, are given camphor before the injection begins.

Occasionally an animal shows rapid cyanosis when the full quantity of chloral has been given. Such cases are to be classed as "accidents." Their circulation can be revived by more camphor. The writer has given them 5 c. c. to 10 c. c. spirits of camphor intravenously, with splendid results—though, of course, this material was injected very slowly. Strychnine is also of assistance, but it nullifies the general effect of the chloral hydrate to a certain extent.

The duration and depth of narcosis varies with the animal and the amount of chloral hydrate given. Thin, nervous, well bred-horses and mules require proportionately more than lethargic, coarse, fat nondescripts. Thus, while the rule followed calls for 1½ drachms per 100 lbs. of body weight, this amount is not all necessary in some cases, and not sufficient in others. It is the effect produced which must be the guide as to how much should actually be given, though the quantity stated furnishes a reasonable basis on which to work. Usually when narcosis has been carried so far that the corneal reflex is markedly lessened, the animal will show no sign of recovery for about 20 minutes, and not regain his feet spontaneously for two hours or more. The lighter the narcosis, the speedier the recovery.

Should the animal struggle before the operation is complete he is rapidly anæsthetised by a few breaths of chloroform vapour. In fact, the writer prefers not to give sufficient chloral to cause *complete anæsthesia*, but to use it only as a *narcotic*, giving such a dose as will

XUM

cause the patient to fall and lie quietly. To this narcosis a terminal anæsthesia by chloroform is sometimes added ; generally, however, a local injection of cocaine and adrenaline suffices admirably.

Case notes will illustrate the method better than further description. The case numbers given are low, because after the first 25 applications the novelty of the method wore off and no detailed notes were kept.

CASE 3.—FISTULOUS WITHERS.

Nine year old H. D. gelding, fair condition, 1,400 lbs.

Gave ¼ grain atropine and 16 drachms chloral hydrate.

Performed the median line (Williams' operation), using 2 oz. chloroform as additional anæsthetic.

CASE 4.—NECK SEROMA.

Eighteen years old riding mare, fair condition, very nervous, 1,000 lbs. weight. Attempted chloroform anæsthesia the previous day; had to abandon on account of cyanosis and dyspnœa.

Gave ¼ grain atropine, 15 drachms chloral hydrate.

Incised, curretted and sutured a large serome at base of neck without further anæsthesia.

Gave 1 grain strychnine. Animal rose in 2 hours.

CASE 7.—EXPERIMENTAL.

Nine year old H. D. gelding, rather poor and rawboned, 1,500 lbs.

Gave ½ grain atropine and 2 ounces chloral hydrate. Animal fell. Gave one additional ounce chloral in recumbent position.

All reflexes were abolished except the corneal, which was slight. Colour good, pulse full and regular.

Sensibility began to return in 20 minutes. In 65 minutes from falling the animal rose and walked well.

CASE 9.—MEDIAN AND ULNAR NEURECTOMY.

Sixteen years old L. D. gelding, 1,250 lbs., fat condition, jugular pulse.

Gave atropine grains ¼, 2½ ounces chloral hydrate required to produce nystagmus.

Incised to median nerve without reaction. Sensation was felt on nerve being lifted. Six drachms chloroform sufficed to complete operation and do ulnar neurectomy on the same leg.

CASE 10.—ROARING OPERATION.

Sixteen year old H. D. gelding, 1,350 lbs., fair condition.

Gave ¼ grain atropine. Twenty drachms of chloral were necessary to cause nystagmus.

Rolled animal on his back and performed the ventricle stripping operation. No further anæsthetic.

CASE 14.—QUITTOR.

Twelve year old L. D. gelding, fair condition, 1,300 lbs., *market* and *positive* jugular pulse.

Attempted to chloroform this animal, but was forced to desist, because of alarming cyanosis and arrested breathing.

Gave ¼ grain atropine ; 16 drachms chloral hydrate ; deep coma resulted.

Performed quittor operation (removal of cartilage).

Gave 5 c. c., 10 per cent. spirits of camphor intravenously. Animal rose in 2 hours.

REFERENCES.


1. Cadiot, P. J. — Précis de Chirurgie Vétérinaire, Paris, 1917.
2. Rehse. — "Ueber die Verwendbarkeit der chloral hydrat narcose in der Veterinarchirurgie." Monat schrifte fur practische Tierheif-Kunde. Bande XXI., 1910.
3. Hobday, F. — "Anæsthesia and Narcosis of Animals and Birds." London, 1915.
4. Muir, S. — "Action of certain somnifacients on the horse." *Journal of Comparative Medicine and Veterinary Archives.* Philadelphia, April. 1900.
5. Nocard — See "Regional Veterinary Surgery," by Jno. Dollar, London, 1912.
6. Bernardini, D. — "L'hydrate de chloral dans l'anaesthésie générale." *La Clinica Veterinaria, Milan.* May-October, 1908.
7. Savage, Alfred. — "Pump attachment for Record syringes." *Veterinary Journal.* August, 1919.
8. Marfori and Leone. — *Il Policlinico,* Pract. Section, June 17, 1917. see page 466. *The Lancet,* London. Sept. 22, 1917.


## A CASE OF MERCURIAL POISONING IN A CAT.

BY FREDERICK HOBDAY, F.R.C.V.S.
*London.*

THE patient, a female cat, five months old, apparently in perfect health, was sent to hospital for oöphorectomy, and was under

observation for a week beforehand, as the owner was away on holiday and was in no hurry about having the operation performed at once.

On the day previous to operation the cat was starved and the operation itself was performed through the flank, both ovaries being satisfactorily removed.

As a general rule we use no antiseptic other than iodine to the skin, but on this occasion I swabbed the wound several times with a solution of the 1 in 1000 hydrarg.-perchlor. solution.

About an hour after the patient had recovered from the chloroform we noticed that it was salivating freely, a frothy saliva exuding from the mouth. This went on continuously for about 12 hours, the temperature becoming subnormal, all food being refused, and death took place in about 16 hours, preceded by a stage of coma.

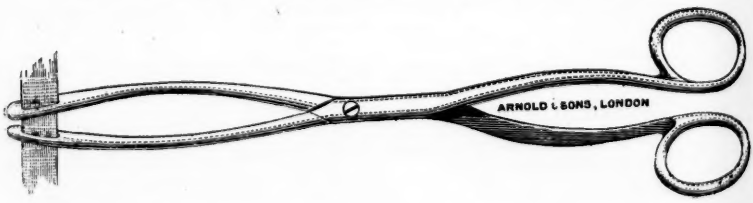
The idiosyncrasy of the cat to many drugs is well known, and I have seen death occur from carbolic acid solution applied merely to the abdominal operation area in a previous case of laparotomy, but I had no idea that toxic effects would follow the use of so small a dose of hydrarg.-perchlor. as must have been absorbed in this case. For this reason the case is placed on record as a warning to others that an idiosyncrasy of the cat for this drug also exists.

## New Appliances.

### NEW BITCH FORCEPS.

SUGGESTED BY CHARLES ROBERTS, M.R.C.V.S.,
*Tunbridge Wells.*

A PIECE of small tape or strong silk or catgut is threaded through the apertures in the jaws of this instrument. This is passed to the back of the occiput of the puppy; the forceps are then opened and the "blades" passed down the sides of the neck and closed underneath




the trachea. The ends of the tape, which have been retained outside the vulva, are then pulled to sufficiently tighten the noose thus formed round the neck of the fœtus and traction can be applied.

The instrument is manufactured by Messrs. Arnold & Sons, Giltspur Street, London, E.C.

# General Articles.

## THE *STRONGYLIDÆ* INFESTING THE HORSE.*

By W. A. Hagan.

Department of Pathology and Bacteriology.

In connection with the autopsies at this college during the last year I have taken the opportunity to make observations upon the character and prevalence of the round worms of the family *Strongylidæ* which infest the caecum and colon of the horse. These observations have shown but little of scientific interest that was not already known, but aside from reporting something of the frequency of the various species from this part of the country, my excuse for offering this paper lies in the general lack of knowledge of them among veterinarians as well as the paucity of our literature on this subject and the inaccuracy of some of what little we have.

All of the round worms which have a habitat in the large intestine of the horse belong to two families, first, the *Strongylidae;* second the *Ascaridae* is represented by the single genus *Oxyuris*, the members of which are commonly called pin worms. This paper has to do, then, with all-round worms which live in the large intestine with the exception of the pin worms.

The family *Strongylidae* is recognised most easily by the presence of a caudal bursa on the male, a webbed-foot like structure which can easily be seen, as a rule, at the posterior extremity without the aid of a magnifier. The members of the family parasitic on the horse fall into five genera, three of which are unimportant. The important genera are *Strongylus*, more generally known as *Scelerostomum*, and *Cylicostomum*. The table given below will serve to show the relationship of the different genera and species to each other.

### Genus *Strongylus*.

This group consists of three quite distinct and easily recognised species, all of which are of common occurrence in horses everywhere. Until quite recently the group was unrecognised as such, all three species being classed as a single species and called *Strongylus armatus*, or more lately, *Sclerostomum equinum*. The three species are very much alike in appearance macroscopically, but it is possible to distinguish between them. Under the microscope the distinguishing features are easily seen. In size the *S. equinus* is largest, the *S. edentatus* is only slightly smaller, while the *S. vulgaris* is much smaller. Viewed with the naked eye the worms may be brownish or quite red in colour,

* From the Annual Report of the New York Veterinary College for the year 1917-18.

depending on whether they are gorged with blood or not. The intestinal tract usually shows through the rather transparent cuticle as a blackish, irregular line. The anterior end always appears very blunt, a "sawed-off" appearance, while the posterior end tapers to a rather blunt point in the female and ends in the large caudal pouch in the male. The bodies are very plump and smooth, the males being considerably more slender than the females. All three are active blood suckers, but *S. vulgaris* is much more active than either of the other two. The mouth cavity is adapted for sucking, there being a rigid bowl-like structure, the aperture of which is armed by a fringe of sharp chitinous denticles adapted for wounding the mucosa of the intestine, followed by a muscular esophagus which is capable of forcible dilatation by the parasite, thus producing a vacuum of considerable degree in the mouth bowl. The parasite first wounds the mucosa with the sharp teeth-like structures and then holds on and sucks blood by creating a partial vacuum in the buccal cavity. The mode of action of the suctorial apparatus can be readily seen to show the principal differences in structure in the three species.

*S. vulgaris.* This form was named *S. bidentatum* by Loos because of the two large lobed structures at the base of the mouth capsule. The males measure a little more than $\frac{1}{2}$ inch in length, the females about 1 inch. This worm is found *almost exclusively in the caecum* and in the recently killed animal so tightly attached to the mucosa that it requires a considerable pull to disengage it. It will be found thus attached until some time after the body of the horse has grown cold. The numbers found may be enormous, and the injury that they do is undoubtedly great. In thirty horses examined, most of which were aged, practically every animal harboured some of the species, and usually there were many present. If the parasite is disengaged a small wound is left. The mucosa of the caecum nearly always shows a number of these wounds, indicating that the parasites lose their hold occasionally and re-establish themselves elsewhere. In the autopsies conducted during the fall months many of the males and females were found accoupled. This is the sexual act. The male lays hold of the female by means of the bursa, the hand-like webbed structure at his posterior extremity, bringing his spicules in place to be thrust into the vagina of the female. The web of the male is held fast by the female by means of a gummy-like substance secreted by the male. In the latter part of the season, nearly all females which are not actually accoupled show this gummy substance around the vagina as evidence of previous accoupling. Fig. 4 shows the appearance of the accoupled pair. The eggs are oval in shape, are thin walled, and are segmenting when laid. They never hatch while in the fæces in the

animal, but this occurs soon after they reach the exterior if conditions are favourable. In fæces examinations it is impossible to distinguish between the eggs of the three species of horse strongyles. The life history of the parasite outside of the animal is unknown. It is supposed that the larvæ are taken in through contaminated drinking water. Inside of the horse, the larvæ bore their way into the submucous coat of the caecum and remain there until approaching maturity, when they emerge through a small hole in the top into the lumen. These cysts appear as raised nodules of the size of a filbert or slightly smaller, and an opening is generally found on the top. They may contain a small quantity of fluid around the parasite. After the worm evacuates, or when it dies in situ, the cavity becomes filled with caseous material which commonly calcifies more or less. The parasite, when approaching maturity, appears very much like the adult, except it is whitish in colour. The immature forms of this worm seem more disposed to wander out into different portions of the body than is the case with most parasites. Thus it is that they are quite commonly found in the liver and lungs, and above all in the trunks of the mesenteric artery. In the body organs the parasite becomes encysted and rapidly dies, so that the verminous nodules consist of débris generally, which in the usual course of events becomes calcified. The non-calcified nodules in the lungs are frequently mistaken for the lesions of glanders.

*Verminous aneurisms.* In ninety-five per cent. or more of all horses over one year old in this state verminous endarteritis is found when looked for. The common seat of these lesions is in the basal branches of the great anterior mesenteric artery, but they are sometimes found in some of the more terminal branches of this trunk, in the aorta, the iliacs and rarely in the cœliac axis. There is usually a fusiform enlargement of the affected vessel and sclerosis of its walls at the seat of the lesion. This enlargement may be as great as a man's head, or it may be quite indistinguishable externally. Upon cutting into the lesion intima of the vessel is found to be very rough or else entirely missing, and the roughened or denuded surface is covered with a fibrinous mass mixed with blood. In this mass the larval parasites may be seen. From their whitish colour they are easily distinguishable against the reddish background. There are several theories as to how these worms get from the intestine into the mesenteric trunks, but the most plausible one seems to be that they migrate upwards from the intestine in the coats of the larger vessels through the vasa vasorum. According to this theory, some peculiarity of construction at the base of the trunk causes the parasites to turn inwards and invade the lumen of the larger vessel itself, thus raising up the endothelium,

3

forming a roughened place and starting the formation of a thrombus. However it is done, the fact remains that in most horses a number of these immature parasites do get free from the intestinal canal and find ultimate lodgment in a very definite location. It was formerly thought that this stage was necessary for the completion of the life cycle of the worm, but at the present time this view has been largely discarded. The immature forms which occur in any other part of the animal body except the cysts in the caecal walls are probably aberrant forms doomed to final destruction without reaching maturity.

It would seem that the peculiar action of these stray forms of invading the large arterial trunks would occasion great harm to their hosts. In some cases it undoubtedly does, but these cases are comparatively uncommon in this locality. Most of the harm here seems to come about where there are heavy infestations in young colts. Disastrous results sometimes occur when emboli break loose from the thrombus and pass down the colic arteries, or more rarely the iliac arteries, plugging them when the artery becomes sufficiently small to stop them. Anastomosis of the arteries to the caecum and the colon is quite good, so that even when emboli are formed they do no material harm as a rule. In case, however, multiple embolism occurs or there is some other fault with the anastomosing branches, there is a blood stasis in the portion of intestine involved, followed by rapid gangrene and death of the animal. Sometimes the endarteritis extends up the mesentric arteries and causes a thrombus to form in the posterior aorta. When this occurs there is apt to be a diminution of its lumen to such an extent that in times of exercise there is an insufficient supply of blood to the muscles of the posterior part of the body, which results in a temporary paralysis. In these cases the animal is usually all right when standing or walking, but will fall if trotted for only a short distance. After a short time the horse can rise again and is normal apparently until put to the same test again.

A number of other obscure conditions have been attributed to the embolism of other arteries from these verminous thrombi, but these cannot be discussed here.

*Identity and Character of Larvæ Occurring in the Verminous Aneurisms of the Horse.* Contrary to the statement made in one well-known text book on animal parasites, the parasites found in these thrombi of the equine mesenteric trunk are practically always *Strongylus vulgaris*. They have proved so in some thirty cases in which I have identified them, and this is in accordance with the findings of the best investigators on this Continent and abroad, The belief has gained popularity in some manner that it is *S. equinus*. Some confusion has no doubt occurred from the fact that the larvæ undergo

a moult while in the blood vessels, and the earlier form bears very little resemblance to the adult. After the moult has occurred there is no excuse for anyone confusing their identity, for they resemble the adults in every way except that the uteri of the females are always without ova,

The moulting process seems to be a very slow one, some individuals being found undergoing the process almost any time from October or November until April or May. The unmoulted parasite tapers at each end, thus having quite a different appearance from the more mature ones, which are markedly truncated anteriorly like the adults. Microscopically the appearance is also quite different, there being a very small mouth opening and no buccal cavity. As the period of moulting approaches changes are noticed near the base of the esophagus, and it is here that the mouth parts of the moulted parasite are formed. Finally the old cuticle ruptures near the middle and part is slipped off over the anterior end and the other part off the opposite extremity. The discarded cuticle contains the shrivelled remnants of the mouth and esophagus of the earlier stage. When this cuticle is being discarded the thin membranes can be easily seen with the naked eye. These stages are illustrated in Figs. 5 to 7. After the moult, the worms grow in size and resemble the adults in every way except that they are much smaller and apparently never become sexually mature. Their ultimate fate is unknown, but they probably die, and being sterile bacteriologically are disintegrated and eliminated. I have, however, in my limited experience, never observed a dead or disintegrating parasite in an aneurism.

*Strongylus edentatus.* Next to the *S. vulgaris*, this species of strongyle is most common in horses in this locality. I have not kept accurate data as to their frequency of occurrence, but I think it is safe to say that the incidence is at least fifty per cent. in horses over one year old. As a rule they are not very numerous. They occur *almost exclusively in the first portion of the colon.* This species does not maintain so strong a hold on the mucosa as does the preceding form, and at autopsy, if the animal has been dead for any length of time, it will be found that many have relinquished their hold and must be searched for in the fæcal mass. Even when the autopsy is performed immediately some of the parasites are always found mixed up with the mass of fæces. An examination of the digestive tract of the worm will also show generally some débris from the colic content of the host, indicating that the food supply is not limited to blood alone. This species resembles very closely macroscopically the other forms. It may quite easily be distinguished from *S. vulgaris* because of the much larger size and also from the habitat, the former being found almost entirely

in the caecum. To distinguish between this form and S. *equinus* with the unaided eye is possible to the experienced, but is not of sufficient importance to the ordinary practitioner to warrant his attempting it unless he has some special interest in the matter. The males measure about one inch and the females one and one-half inches in length, this being a little less than *S. equinus*, but the graduation in sizes is too little to aid in distinguishing between them.

The immature stages of this species also live in cysts in the intestinal wall normally. Aberrant forms are frequently found encysted beneath the peritoneum and sometimes the pleura. In these locations they occasion slight thickenings of the serous membrane and frequently cause a hemorrhagic zone to be formed about them. When these spots are cut into, the immature parasite is found coiled up in a cavity just large enough to accommodate it. The body is whitish, and when reaching maturity resembles that of the adult very much. I do not know whether there is a moulting stage as in case of *S. vulgaris* or not. I have seen only four cases showing these encysted forms and in all cases they resembled the adult. Three of these cases showed only two, three to one-half dozen forms, while the fourth showed them very numerously in both abdomen and thorax, When there are only a few forms they may be readily overlooked when making an autopsy.

*Strongylus equinus* (*Strongylus quadridentatus*—Loos).—This species is very much scarcer in this locality and, I believe, in most places, than either of the others. Specimens were found in about ten per cent. of the cases examined. The adults, as has been said before, are almost identical in appearance, macroscopically, with *S. edentatus*. The habits, as far as is known, are almost identical and they are found *in the first division of the colon*. Aberrant forms are less common than among the other species. I have observed but a single case. This one was the same as mentioned above, in which numerous encysted forms were found beneath both peritoneum and pleura. Some of these parasites proved on examination to be *S. equinus*. The adult males measure about one and one-fourth ($1\frac{1}{4}$) inches and the females one and three-fourths($1\frac{3}{4}$) inches in length.

### Genus *Cylicostomum*.

Comparatively little is known about this genus, although it contains more species than all the other genera of the family. Mehlis described *C. tetracanthum* in 1831, this name standing until Loos in 1900 split the species into thirteen species. Since that time four others have been added, and there are certain to be more as more investigation is done, so that at the present time we have a dozen and a half species which

formerly were considered as one under the name *Sclerostomum* or *Strongylus tetracanthum*.

It is impossible to identify the particular species of a member of this group without the use of a microscope with a high magnification, and so far as we know there is no particular reason why a practitioner should care to do so except for the scientific interest. All the members are small, the largest specimens being less than one inch in length and many very little more than one-quarter of an inch. The general proportions are about the same as among the *Strongyli*, the anterior end being square cut and the posterior end tapering. When magnified, it is seen that all possess a sort of a raised collar at the anterior end which serves to give the mouth a set-off appearance from the rest of the body. The bodies of all are brownish, whitish or reddish, and being of about the same size and appearance as much of the straw and other materials in the horse's colon, they are easily missed at autopsy even when massive infestations are present. They are found in both caecum and colon, especially in the posterior parts of the latter. It is seldom that a single species is found alone, it being the rule to find four or five or more different species together. Cylicostomes are quite common in this state, at least thirty per cent. of all horses harbouring them. When any are found they are generally numerous, and sometimes when the fæces are examined very carefully they are found to be literally alive with them. I have found at least five different varieties in horses at the post-mortem table here without giving the subject any particular study, and I am reasonably sure that as many more would be found if work had been done systematically on them. Ransom and Hadwen found twelve described and several undescribed species in horses in Canada in 1917.

The eggs of the cylicostomes are very similar to those of the strongyles, but they are longer and narrower and may be distinguished from them by these features. The ova of the different cylicostomes cannot be distinguished one from the other.

Little is known about the life cycle of these parasites. Railliet claims that the immature forms become encysted in the intestinal wall. I have not observed any of these cysts. Loos says that the adults live entirely on intestinal débris and are not blood-suckers. I have never found any attached to the mucosa, but from the blood red colour of some of the specimens I have seen I am inclined to the opinion that blood forms a part, at least, of the diet of some of them. Furthermore, a number of foreign veterinarians are of the firm conviction that many cass of severe marasmus of the horse are due to cylicostomes. These men regard them as blood-suckers. The point can easily be

decided by examining their intestinal tracts for hæmoglobin or red blood cells.

| Family | Sub-family | Genus | Species |
|---|---|---|---|
| Strongylidae | 1. Metastrongylinae | None parasitic on the horse | |
| | 2. Trichostrongylinæ | None parasitic on the horse | |
| | 3. Strongylinae .... | Oesophagostomum<br>Chabertia<br>Ankylostoma<br>Uncinaria<br>Bunostomum<br>Syngamus<br>Stephanurus | None parasitic on the horse |
| | | Strongylus ..... | S. equinus<br>S. vulgaris<br>S. edentatus |
| | | Cylicostomum .... | C. labiatum<br>C. tetracanthum<br>C. labratum<br>C. alveatum<br>C. poculatum<br>C. bicoronatum<br>C. catinatum<br>C. elongatum<br>C. nassatum<br>C. calicatum<br>C. auriculatum<br>C. radiatum<br>C. coronatum<br>C. mettami<br>C. euproctus<br>C. insigne<br>C. goldi |
| | | Oesophagodontus .. | O. robustus |
| | | Gyalocephalus ... | G. capitatus |
| | | Triodontophorus .. | T. serratus<br>T. minor<br>T. tenuicollis<br>T. brevicauda<br>T. intermedius |

GENUS *Oesophagodontus.*

This genus contains but one species, *Oesophagodontus robustus*, described from England and India and lately from Canada. It has never been reported from the United Stated heretofore. I have a single specimen collected among a number of cyclicostomes. The mouth parts differ quite greatly from the cyclicostomes, but otherwise it resembles them very much. From its evident scarcity it is probably of little importance.

GENERA *Gyalocephalus* AND *Triodontophorus*

I have encountered no specimens of either of the above genera. Both have been reported by Ransom and Hadwen from Canada and abroad by others. One species, *Triodontophorus tenuicollis*, was found by Ransom and Hadwen to be associated with extensive ulceration of the colon. There is but one species of gyalocephalus described, *G. capitatis*, a parasite less than one inch in length. The Triodontophori are less than one inch in length. Nothing is known of their life history.

BIBLIOGRAPHY.

BOULENGER. Sclerostome Parasites of the Horse in England. I. The Genera Triodontophorus and Oesophagodontus. *Parasitology*, Vol. 8, No. 4, p. 420.

Sclerostome Parasites of the Horse in England. II. New Species of Genus Cylichnostomum. *Parasitology*, Vol. 8, No. 4, p. 203.

LOOS, A. The Sclerostomidae of Horses and Donkeys in Egypt. Record Egyptian Government School of Medicine. 1900, pp. 25–139.

RANSOM, B. H., and HADWEN, S. Horse Strongyles in Canada. *J. A. V. M. A.* Vol. LIII, N. S. Vol. 6, No. 2, p. 202, 1918.

URBAIN, M. Marasmus of Army Horses. *Revue Générale de Médecin Vétérinaire*, June, 1918. Abs. *J. A. V. M. A.* Vol. LIII, N. S. Vol. 6, p. 778, 1918.

WILLIAMS, W. L. Invasion of the Mesenteric Arteries of the Horse by the Strongylus Armatus. *Vet. Jour.*, Vol. 29, p. 158.

## Abtracts.

LAPARO-HYSTEROTOMY.

BY J. D. CHATTERJEE, VETERINARY SUPERINTENDENT, in charge Jind Kennels. Jind State (India.)

JIND ROSEBERRY—a fine little black pug bitch by Nyassatony-ex-Mistress Gillian, was mated to Corona Magnet, a fawn imported pug dog, on the 18th and 20th December, 1918, and was in whelp. She was due on the 18th February, 1919, *i.e.*, on the 63rd day, but she did not show any sign of labour pain till 22nd, at 9 a.m. At about 12 a.m. she was bad and the labour pain was severe without delivery, and began to evince prostration. At 4 p.m. she was in great agony and prostrated, when endeavour was made to help the delivery by manipulation and forceps, but all were in vain, as the

pup was too far away attached in the cornua of the uterus. Thereupon decided to relieve the bitch by operation, which was performed at 11 p.m.

The operation was performed as follows :—

1. The instruments, silk sutures were sterilised by boiling and putting them into Lysol solution (1–200).

2. The seat of operation properly shaved and wiped with Lysol solution (1–200) and dried with dry sterilised cotton wool, then painted the part with tinct. iodine decolarata.

3. The seat selected for operation was on the linea alba.

4. The bitch was put under A.C.E. mixture, and when she was thoroughly under the influence of the mixture, operation was performed, just according to the instruction laid down in Fleming's Obstetrics.

As a result of the operation, two pups were taken out ; one was still-born, and the other one, a fawn bitch, alive. After the operation the patient was put within the crate with a clean towel underneath. At 2 a.m. the surviving pup was allowed to her, and she began to lick the pup and appeared taking care of it, and allowed it to suck.

Next morning the temperature went up to 106 degrees F., and the bitch was very dull with laboured breathing, but the temperature went down to 102 degrees F. in the evening. There was no more rise of temperature and constitutional disturbances.

On the 26th February the sutures were washed with germicidal soap (P. D. & Co.) and luke-warm water, cleaned with Lysol solution (1–200) and dusted boracic acid powder.

On the 1st March, 1919, the sutures were removed and the wound healed up by first intention. Every care was taken and men were on duty to prevent the bitch licking the sutures. Both the pup and the bitch are still living and the pup is turning a pretty one.

## Clinical Cases.

### CLINICAL AND CASE REPORTS.

By E. I. SMITH, Inspector in Charge, B.A.I.,
*Baton Rouge, Louisiana.*

A local cattle inspector (layman) while engaged in the work of tick eradication in Louisiana spilled some of the concentrated arsenical preparation on his shoulder while engaged in charging a vat for the morning dipping. He did not take time to wash off the solution, but, on the other hand, proceeded to supervise the dipping of about 150 head of cattle. Suddenly he became sick and two physicians were called, who, after closely observing the symptoms and noting the history of

the case, pronounced it arsenical poisoning. In spite of skilful medical attendance the patient died six hours after the accident.

The writer has been actively engaged in the work of tick eradication since 1909 and cannot recall a similar fatality in man as a result of handling the concentrated dip or in preparing the crude chemicals. Heretofore, in a few instances, inspectors have been slightly nauseated from breathing the steam in the preparation of the boiled dip containing arsenic, but not of a serious nature. The concentrated solution in this case required that ten gallons of it be diluted with 1,500 gallons of water, to yield a quantitative test of 19 one hundredths of one per cent. of arsenic, which in the end is harmful only to ticks and other parasites of a similar nature.—*Journal of the American Veterinary Medical Association.*

---

## THE AMENDED ANIMALS (ANÆSTHETICS) BILL.

A BILL "as amended by the Select Committee" intituled an Act to make further provision for the Protection of Animals from Cruelty.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1.—(1) If any person shall subject or cause or procure, or being the owner permit to be subjected, an animal to an operation contrary to the regulations contained in this section, he shall be guilty of an offence under this Act.

(2)—(*a*) A horse, a dog, a cat, or a bovine shall not be subjected to any operation specified in the First, Second, or Third Schedules of this Act, respectively, unless the animal during the whole of the operation is under the influence of some general anæsthetic of sufficient power to prevent the animal feeling pain.

(*b*) A horse, a dog, a cat, or a bovine shall not be subjected to any operation specified in the Fourth, Fifth, or Sixth Schedules to this Act, respectively, unless during the whole of the operation it is under the influence of some general anæsthetic or some local anæsthetic being, in either case, of sufficient power to prevent it feeling pain.

2. Any person who is guilty of an offence under this Act shall be liable on summary conviction in respect of the first offence to a fine not exceeding five pounds, and in respect of any second or subsequent offence to a fine not exceeding twenty-five pounds, or alternatively, or in addition thereto, to be imprisoned for any term not exceeding three months.

3.—(1) The Board of Agriculture and Fisheries may, by order made subject to the provisions of this section, add any other operation to the operations specified in any schedule to this Act, and any operation so added shall be deemed to be an operation specified in that schedule, and the Board of Agriculture and Fisheries may also, by order made as aforesaid, extend any provision of this Act to any domestic animal to which it does not at the time apply, with such modifications or additions as may appear to that Board to be necessary.

The Board may, by order made subject to the provisions of this section, declare any substance to be a suitable general anæsthetic or a suitable local anæsthetic for the purposes of this Act, and any substance so declared shall be deemed to be a general anæsthetic or local anæsthetic, as the case may be, of sufficient power to prevent the animal feeling pain if properly applied.

(2) The draft of any such order shall be published for a period of three months before the order is made, and the Board of Agriculture and Fisheries during that period shall receive and consider any representations made to them with respect to the order by any persons appearing to them to be interested in the subject of the order.

(3) That order, when made, shall forthwith be laid before Parliament, and shall not take effect until it has so lain for thirty days before each House of Parliament, being days upon which that House has sat, and if a resolution is passed by either House before the expiration of such days declaring that the order be annulled, the order shall not take effect but if no such resolution is passed the order shall not take effect on such day after the expiration of the last day on which any such resolution might have been passed as the Board of Agriculture and Fisheries may appoint.

4. In this Act, except the context otherwise requires, the expression " horse " includes pony, mule, jennet or donkey ; a horse is deemed to be two years old on the first day of the second January after it was born.

5. Nothing in this Act shall apply to any experiment to which the Cruelty to Animals Act, 1876, applies.

6. This act in its application to Scotland and Ireland shall have effect with the substitution of references to the Board of Agriculture for Scotland and the Department of Agriculture and Technical Instruction for Ireland, respectively, for any reference to the Board of Agriculture and Fisheries.

7. This Act may be cited as the Animals (Anæsthetics) Act, 1919.

## SCHEDULES.

### FIRST SCHEDULE.

HORSES.

1. Operation for quittor.
2. Operation for stripping the wall or sole of the hoof.
3. Operation for poll evil.
4. Operation for fistulous withers.
5. Ovariotomy.
6. Laparotomy.
7. Amputations of penis, mamma, uterus.
8. Extraction of permanent molar teeth.
9. Operations for scrotal and inguinal hernia.
10. Operations for scirrhous cord and extensive tumours.

### SECOND SCHEDULE.

DOGS AND CATS.

1. Castration in animals six months old and upwards.
2. Ovariotomy.

3. Laparotomy.
4. Amputations of penis, mamma, uterus.
5. Operations for scrotal and inguinal hernia.

THIRD SCHEDULE.

BOVINES.

1. Ovariotomy.
2. Operations for actinomycosis.
3. Laparotomy.
4. Amputation of penis, mamma, uterus.
5. Dishorning cattle over three months old.

FOURTH SCHEDULE.

HORSES.

1. Neurectomy or unnerving.
2. Enucleation of the eyeball.
3. Line and point firing.
4. Operation for umbilical hernia.
5. Urethrotomy.
6. Docking of the tail.
7. Trephining.

FIFTH SCHEDULE.

DOGS AND CATS.

1. Enucleation of the eyeball.
2. Operation for umbilical hernia.
3. Urethrotomy.
4. Docking of the tail.

SIXTH SCHEDULE.

BOVINES.

1. Enucleation of the eyeball.
2. Operation for umbilical hernia.
3. Rumenotomy.
4. Urethrotomy.
5. Trephining.

AMENDMENT TO BE MOVED IN COMMITTEE BY THE LORD CLANWILLIAM (*E. Clanwilliam*).

Clause 1, page 1, line 14, at end insert ("Provided that in respect to the dishorning of cattle this regulation shall not come into force for a period of two years from the passing of this Act").

## Obituary.

### DEATH OF MR. P. G. BOND.

MR. PETER GILLARD BOND, one of the best known veterinary surgeons in the Plymouth district, has not long survived his old friend and fellow practitioner, the late Mr. Bloye. After an illness of considerable duration, he passed away at his home, 105, Union-street,

Plymouth, last evening, at the age of 67. A native of Kingsbridge, and the son of a yeoman, he while still in his teens, left home and obtained employment with a noted firm of chemists in London. Whilst so engaged he saved enough money to pay his student's fees in order to realise his ambition of becoming a qualified veterinary surgeon. At the Royal College of Veterinary Surgeons, London, he worked hard, and distinguished himself, being a silver medallist in cattle pathology and first Fitzwygram prizeman in 1886. In the same year he established himself at Plymouth, and founded an extensive practice in South Devon and East Cornwall. For many years he had been an inspector under the Board of Agriculture. Among those who retained his services were successive Earls of St. Germans, the late Mr. Charles Trelawny and Mr. W. Coryton, and the Corporation of Plymouth.

For many years he was a keen follower of the Dartmoor hounds, under three M.F.H.'s, and was greatly respected by them all. In addition to his professional work, he did a great deal, and at his own cost, to promote a better class of horse-breeding in the district and for that was warmly commended by officials of the Board of Agriculture. An esteemed member of the Plymouth Institution, he quite recently delivered two highly interesting and admirably illustrated lectures. Both related to his own country—the South Hams—which he loved so well, and of whose families, old customs, and folk-lore he had a remarkable fund of knowledge. One of the lectures was devoted to those natives of the district who had exercised a great influence in various ways at Plymouth, and the other dealt with men and women of the South Hams who had rendered great service to the State as legislators, soldiers, sailors, chemists, lawyers, merchants, &c. He had also lectured before the chemical section of the Plymouth Institution, and often took part in its debates.

He leaves a widow, to whom will be extended the sympathy of a large circle of friends who esteemed her husband for his skill and knowledge, sterling integrity, and a never-failing geniality and desire to serve.

## MR. W. H. BLOYE, PLYMOUTH.

By the death of Mr. Wm. Harvey Bloye, which took place at his residence in Ebrington Street, Plymouth, on Thursday, the veterinary profession has lost a distinguished member. Deceased, who was 63 years of age, devoted a busy life-time to the study of the treatment of animals, and while he was essentially skilled in the practical usages of the art, and was a successful business man, he concentrated upon the scientific side, and in this connection could be described as a brilliant

veterinary surgeon. He was apprenticed to the late Mr. Collings (Raddall and Collings), and qualified as M.R.C.V.S. in 1883. In 1891 he obtained his Fellowship Degree. From 1895 to 1900 he held the appointment of Examiner for the M.R.C.V.S. Degree to the Royal College of Veterinary Surgeons in Class A (Anatomy), and from 1900 to 1919 he examined, similarly, in Class "D" (Veterinary Medicine). Further he was Examiner for the Fellowship Degree. In 1899, when the delegates visited Plymouth, he was the popular President of the National Veterinary Association. Mr. Bloye worked strenuously during the war under the Army Remount Department.

He had been in business for about thirty-five years. His wife predeceased him by seven years, and he leaves a son (Mr. Percy Bloye who has followed his father's profession,and has qualified as M.R.C.V.S.; Mr. Bloye served in the R.A.V.C. with the rank of captain, and fulfilled duties on the Headquarters of the XVIIth Army Corps. The serious and last illness of his father necessitated his recall from Belgium.

## Correspondence.

*To the Editor of the* VETERINARY JOURNAL.

### QUARTER ILL IN HEIFER.

SIR,—With reference to the letter of Mr. F. T. Harvey regarding my recent communication on Quarter Ill in Heifer, the diagnosis was not confirmed bacteriologically. This area in which the case occurred is notorious on account of the number of cases of Quarter Ill among cattle and sheep, the mortality in sheep being very high. An outbreak among a thousand lambing ewes in this district was an exceeding serious and fatal one.

The losses were very heavy, and continued so, until the remaining animals were removed to new grazing several miles away, when the outbreak suddenly stopped. Bacteriologically examinations were made and one ewe carcase was sent entire to the Principal of the Royal Veterinary College, London, who had no difficulty in finding the organism of Quarter Ill, the Bacillus Chauvoei being very plentiful especially in the uterus.

In the many sudden and fatal cases, extending over a number of years, in which I had the opportunity of making a bacteriological examination, the pathogenic organism was invariably the anærobic spore bearing bacillus of symptomatic anthrax.

In areas of high cultivation in Central Ross-shire it is extremely rare to meet a case of Quarter Ill, as contrasted with the hilly district to which the disease is almost entirely confined.

It is besides well known that the organism of Welch (B. Perfringens) is much more fastidious in its tastes than the B. Chauvoei, the former being very abundant in the soil of highly fertilised areas and has recently assumed great importance on account of its causing gas gangrene in shell wounds in Belgium.

Through the courtesy of the Pathologist of a large institution in the south in which wounded soldiers were treated I had frequent opportunities of examining the organisms from their clothing and wounds.

It was found that cultures from the clothing of men who came from the trenches almost always showed the B. Welchi, less frequently the Tetanus Bacillus, streptococci being rather frequent. From cultures taken about the second week from wounds infected from such clothing, it appears that B. Perfringens became less frequent, giving place to streptococci, staphylococci and coliform bacilli.

Under the circumstance a bacteriological examination at the time seemed unnecessary. I notice in my communication that the word "sacrum" was used instead of "lumbar" in describing the extent of the swelling.

G. GAIR, M.R.C.V.S.

## Review.

BIRDS BENEFICIAL TO AGRICULTURE. (Economic Series No. 9, British Museum of Natural History.) Printed by Trustees of the British Museum. Price 2s. Published by Quaritch, Grafton Street, W., and Dulan & Co., Margaret Street, Cavendish Square, W.

IN a little brochure of some 47 pages, beautifully illustrated, Mr. F. W. Frohawk places before the public the chief of the English birds of value to agriculture, together with their habits, life history, the respective classes of insects they prey upon, and the troublesome species of weeds they help to devour.

The benefit of the bird to agriculture is universally admitted, and anything which promotes knowledge in this respect is to be welcomed. Mr. Frohawk's book is full of interest and should be placed within the reach not only of every agriculturist but of every boy who wishes to know something of the practical facts of Natural History. The descriptive text is written in the clearest and simplest language, and the photographic plates make the recognition of the bird described a matter of facility.

To the members of the veterinary profession engaged in country practice it will add many items of interest to their general knowledge and form a useful source of conversation with their agricultural clients.

**NOTICES.**

All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C.2. Telephone: Gerrard 4646. Telegrams: "Baillière-Rand, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

Manuscript—preferably typewritten—should be on one side only of paper, marked with full name of author.

Illustrations for reproduction should be in good black or dark brown ink on white paper or card.

Advertisements and all business matters relating to the JOURNAL should be addressed to the publishers, Messrs. Baillière, Tindall and Cox.

Annual Subscription for the British Empire, 18s., post free; for the United States, $4.50; or combined subscription with the "Veterinary News" (weekly), 30s., post free.